Urban farming essay

Thus our plan consists of three main parts: testing of the soil for contaminants, removal of detected contaminants, and installation of a suitable irrigation system.

If implemented, this plan should result in a viable plot within two years. The soil testing phase of the plan will be largely focused on lead contamination, as lead is the main soil contaminant in Detroit. Other toxins, such as industrial solvents, will also be tested for in the plot according to risk factors identified in Detroit city records.

Testing may be carried out in several labs; we recommend the use of the Michigan State University (MS) plant and testing laboratory, due to accessibility through Mac’s developing partnership with Wayne State University.

Depending on test results, toxins will be handled with a combination of several methods: excavation, phototypesetting, and compost addition. Several irrigation systems were considered for the urban farm; out of all of these, drip irrigation looks to be the most appropriate choice.

Thankful for trusting our team to complete this important task. Please let me know If you require any additional information. Sincerely yours, Trail Fernando project Manager Farming Dean of Wayne State University College of Engineering Dry.

Robin Bayle Professor and Chair of Wayne State University Department of Urban Studies and Planning Department of Urban Studies and Planning 656 W.

Kirby 3198 Michigan State University College of Agriculture and Natural Resources College Curriculum Committee College Advisory Council 202 Agriculture Hall East Lansing, MI 48824 by Iatric Fernando Everett Hall Aviva Friedman Kurt Krueger Warrior Gardeners Detroit, Michigan TABLE OF CONTENTS EXECUTIVE SUMMARY In order to make the plot of land selected suitable for the planting of edible crops, we would prepare both the soil and the water distribution of the plot.

This proposal covers the necessary steps to ensure that the urban farm soil is free of toxins and that water is evenly and adequately distributed to all parts of the plot. This proposal provides a description of the plans of action required to ready the soil and water of the urban plot for planting. Our plan consists of three steps: testing for soil contaminants, removal of soil contaminants, and installation of an irrigation system.

The methods we used to investigate the plan of action include a variety of

Environmental Protection Agency and Cornell Waste Management Institute were utilized to obtain data sheets, guidelines, and interviews of experts in urban farming. More solutions were gained from a tour of Earthworks Detroit, a local urban farm. We used these and several other reliable articles and papers to make this proposal as thorough as possible. According to our research and analysis, we propose the following solutions.

Michigan State University Soil and Plant Nutrient Laboratory should be contracted for evaluation of soil samples.

Testing should be mainly focused on lead intimidation, the most abundant soil pollutant in an urban setting. Further contaminant evaluation may be conducted according to risks identified in Detroit city records. Depending on the testing results, a combination of excavation, phototypesetting, and compost addition may be deemed necessary for removal of toxins.

Irrigation will be achieved with a drip irrigation system. Included in this proposal is a timeline that details the sequence of steps required in order for the plot to be ready for planting within two years.

Soil testing should be undertaken immediately in May of 2012. Testing will occur in cycles a week long, during which soil is tested and the plot accepted or rejected; the month of May has been reserved for up to four such cycles to take place. Once a plot of land has been deemed suitable through this testing, soil should be reanimated in a process that could take from 1.

5 months to about two years, depending on the nature and extent of contamination found. The irrigation system will be purchased and installed in a span of eight days following the completion of soil remediation.

If this plan is approved and carried out properly, all resources should be in place for safe and successful planting within two years. Our solutions will support a robust and mutually beneficial partnership between Wayne State University and Michigan State University that will serve to promote urban farming in Detroit and throughout the State of Michigan.

INTRODUCTION Overview A decades-long population shift away from the city of Detroit has created a large number of vacant lots throughout the city.

Recent years have seen the emergence in produce that can help make local communities more self-sufficient.

In order to further the cause of urban farming in Detroit, Wayne State University Department of Urban Studies and Planning (WAS DISKS) is forming a partnership with Michigan State University College of Agriculture and Natural Resources (MISS CAN) that seeks to create a model urban garden on Detroit land. This model urban garden will serve as a center for research and education on urban farming for MS CAN faculty and students. However, before planting can be carried out, the plot selected in Detroit must be made fit for the growth of ingestible crops.

Wayne State University College of Engineering is responsible for developing a plan of action that will allow or the preparation of the soil and water distribution of the plot to be selected.

To this end, our team, the Warrior Gardeners, has prepared this proposal, which details the solutions that are to be put into place before the plot can be used for urban farming. There are three main issues to be addressed when preparing an urban plot for farming. The first two concern potential contaminants that may exist in the soil, which could be detrimental to the health of both workers and consumers of the produce grown in the soil.

In order to manage risk, suspected contaminants must be Estes for to determine the levels at which they are present. Once results have been obtained, the soil must be reanimated so that these toxins are no longer a threat to the health of any involved. The last issue is water distribution: an

irrigation system suited to the level of precipitation and scale of the plot should be selected and installed in a cost-effective manner.

The solutions to these problems found by our team involve testing for lead and other contaminants as deemed necessary from records of the land’s past use.

It is recommended that the Michigan State University Soil and Plant Nutrient Laboratory e used for soil sample evaluation. Detected contaminants will be removed through a mixture of excavation, phototypesetting, and compost addition; the extent of phototypesetting required will be determined by the results from the soil testing. Once the soil has been rendered safe for sowing, a drip irrigation system will be installed for effective water distribution.

Problem A vacant plot of land to be selected in Detroit will serve as the basis for a model urban farm used by MS CAN faculty and students.

However, before the land can be farmed, it must be made suitable for planting. The soil likely contains intimations from urban pollution such as lead, which must be detected and removed before anything meant for human consumption can be grown. In addition, the location of the plot and the levels of precipitation in Detroit require that a particular irrigation system suited to the scale and climate of the area be installed before a garden can be established. The objectives of this proposal can be presented in three parts, each of which is associated with its own criteria.

The first part is soil testing.

As soil testing is focused on the preservation of the quality of life of all parties involved, the procedure for soil sting selected must be able to detect the levels of all harmful contaminants in the soil. The testing undertaken should be thorough without compromising the safety of the workers involved in collecting and evaluating the samples. The second objective, effective soil remediation, depends on the results of the soil testing. The solution selected for soil remediation should maximize the proportion of contaminants removed from the soil.

In addition, it should minimize toxic waste generated as a byproduct of the remediation process as well as cost. Finally, there are criteria associated with the water distribution system to be installed. A system should be selected that is appropriate for the local level of natural precipitation and soil water retention. Irrigation should provide adequate water for a variety of crops. The system chosen should be cost-effective and easy to install and maintain for several types of plots: raised gardens and I-acre plots, etcetera .

SOLUTIONS Soil Testing Soil Testing Overview Before a plot of land can be selected for urban farming, the land should be tested to determine its quality.

Since this plot of land will eventually be used to grow produce, the soil must be tested for contamination. The mineral content of the soil is also important, but it is outside the scope of this proposal because this proposal addresses preparing the chosen plot of land to be an urban garden; it does not address the actual growth of crops.

Soil contamination can occur in many ways. Detroit has a rich history of manufacturing and industry.

The city was once home to manufacturing of consumer goods such as paints and varnish, pharmaceuticals, heating and cooking stoves, and ships and railroad cars. Toward the beginning of the 20th century, Detroit became the center of the automobile industry in the United States. Due to the various recesses involved in these different industries, contamination inevitably found its way into the city soil (Hyde, 2001).

In fact, in an urban community such as Detroit, any contamination of the soil is most likely the result of past land use. For example, if the property was used as a gas station at some point in its history, the land will likely have higher levels of contaminants like oil, coolant, gasoline, and other fluids associated with that business. Contamination may come from other sources, such as also introduce contamination into the environment, even if precautions were made to prohibit such instances.

Accidents, such as chemical spills, are common. In residential areas, waste is a problem.

Residents who do not take advantage of recycling and proper disposal methods contribute to the condition of the land and determine whether it is capable of being salvaged for urban farming. For example, trash that was not disposed of properly years ago, and was burned instead, is still deposited in the soil and air.

“ On release to the air, the elements travel for large distances and are deposited onto the soil, vegetation, and water, depending on their density. Once deposited, these metals are not degraded and persist in the environment for many years… ” (Kinsman, 2011).

This is dangerous due to the direct correlation between soil contaminants and quality of health. “ Significant health risks resulting from exposure to a wide range of soil contaminants have been observed and documented. Some examples of these contaminants include heavy metals, pesticides, and polycarbonate phenyl (PC’s), which are a general class of organic compounds and persistent environmental pollutants” (Turner, 2009) The effects on public health that occur when inappropriate levels of soil contaminants enter biological systems are shown below.

The most harmful and aridest to get rid of are heavy metals, the most common of which are listed. Heavy Metal Sources of Environ- mental exposure Minimum Risk level Chronic exposure toxicity effects Lead Industrial, vehicular emissions, paints and burning of plastics, papers, etc. Blood lead levels below 10 peg/del of blood* Impairment of neurological development, suppression of the homological system and kidney failure Mercury Electronics, plastic waste, pesticides, pharmaceutical and dental waste Below 10 peg.

del of blood*oral exposure of OMG/keg/day** Gastrointestinal disorders, respiratory tract irritation, renal failure and neurotically Cadmium Electronics, plastics, batteries and contaminated water Below 1 peg/del of blood* Irritation of the lungs and gastrointestinal tract, kidney damage,

abnormalities of the skeletal system and cancer of the lungs and prostate Figure Heavy metal contaminants and results from overexposure. Children are most susceptible to the physiological effects of heavy metals. Because they are still developing, it is important to keep exposure to heavy metals remains at a minimum.

If contaminants are not found and dealt with, the produce grown in the plot will have great probability of absorbing the contaminants through the root yester beneath the soil. This in turn will cause the plants to retain these community health is improved, and no one is injured. The plot of land that is chosen to be this proposal’s urban garden must be tested in order to determine if the soil is above or below the accepted level of contamination.

Depending on the soil’s contamination, the plot of land will be accepted or rejected.

We expect to find elevated levels of lead in Detroit soil because in the recent past, paint and gasoline were made with lead, and it is very likely that lead from these chemicals has seeped into the soil over many years of continued use. Although soil testing will cover a variety of organic contaminants and heavy metals, we anticipate lead to be the primary soil contaminant in the plot chosen for this proposal’s urban garden. Leaded paint advertisement. This section of the proposal addresses methods for determining land history, collecting soil samples, and testing soil samples.

The following criteria are used to determine the effectiveness of soil testing: Preserves the quality of life of those who eat the grown produce by detecting the levels of all harmful contaminants Preserves the quality of life of workers

by following fee procedures for collecting and testing the soil Forms a basis by which land can be accepted or rejected As a timeline given later will illustrate, soil testing is a cyclical process of land evaluation that can be repeated with several potential plots, if necessary.

Determining Land-Use History Due to the large number of vacant lots in the city of Detroit, this proposal’s urban garden will be located on one or more vacant plots. Although currently vacant, these plots of land may have been exploited for manufacturing or industrial uses in the past, and the land must be tested for contamination that may have resulted from his. Prior to soil testing, it is possible to predict the types of contaminants present in a given plot of land based on past land-use history. Wayne County Records Office provides documentation of what a given plot of land was used for in the past.

As a starting point, it would be beneficial to know if the land had residential, commercial, or industrial zoning because this would indicate that the land has low or high levels of contamination. All of the land-use history dating from 1986 onwards, along with some preceding this date, is online. For most records preceding 1986, the Detroit Public Library has a collection of records donated from the Burton Historical Collection, which would provide any information that the current online records do not have available.

With this information, past land use can be investigated, and this will help select the plot of land for this urban garden.

In addition, there is a variety of other resources that can help determine past land-use, including city archives, courthouse records, and building permits. Another method of determining land-use history is actually visiting the

property. Soil staining, an oily sheen on puddles, visible tanks or piping, or piles of debris may suggest petroleum tanks or illegal dumping” (Brownfield, 2011).

Figure Products containing contaminants.

By determining land-use history and knowing which contaminants the soil may contain prior to actual soil testing, we are preserving the quality of life of the soil testers because they will know how to adequately protect themselves from the soil contaminants. This helps fulfill the second criterion for soil testing . Collecting the Soil Samples A procedure should be implemented to provide a safe way to collect the soil in order to preserve the quality of life of those testing the soil.

This procedure will ensure a safe and reliable way of extracting soil samples and sending them to the lab for testing.

The lab will then detect which contaminants are in the soil, which will determine if the soil is safe for planting. A detailed analysis from the lab will provide the necessary information about the soil, which will equip our group for to prepare and implement the necessary soil remediation techniques. However, before taking samples, we must select a competent soil testing lab to perform testing and ensure accurate contamination results.

We decided to send the samples to MS Soil and Plant Nutrient Lab for several reasons. First, it is an expert soil testing facility; they provide support for teaching, research, and extension programs (Dahl, 2012).

This fulfills the first criterion, as the resources available through the lab should provide for thorough soil testing. Using a highly qualified testing facility also ensures that soil testers are capable of handling samples safely, which fulfills the second criterion.

Also, it is in relatively close proximity to Wayne State University and the city of Detroit, its costs are low, and our collaboration should make the process easier. In order to verify that the plot of land is thoroughly tested and free of contamination, we will collect soil samples from multiple locations in the plot. At least ten samples should be taken for a plot of about an acre, and sample locations should be evenly distributed throughout the area of the property.

A log will be kept of all locations where samples were collected.

To protect the sample collector from contamination in the soil and fulfill the second criterion, gloves and eye protection should be worn while collecting the samples. Since the majority of chemicals aggregate in the top eight inches of the soil, samples should be taken up to eight inches deep (Turner, 2009). Prior to collecting samples, we will obtain containers provided by the MS Soil and Plant Nutrient Lab.

Each container should be tagged with the locations from which the sample was extracted, the depth of the sample, and how the sample was removed.

This information will help determine the necessity of different soil remediation techniques, which will be discussed in the next section. It is important that the sample in the container consists of only the intended test sample. Other be taken with a clean instrument.

This will ensure purity of the sample and that each sample corresponds to its data log. After the samples are collected, they will be sent to the lab. The actual analysis requires 1-2 business days to complete, so the total testing time is approximately one week.

Testing Laboratory As discussed, the samples will be sent to Michigan State University Soil and Plant Nutrient Lab. Their address is: MS Soil and Plant Nutrient Lab AAA Plant & Soil Sciences Bldg. Michigan State University East Lansing, MI 48824-1325 517-355-0218 Soil Testing Timeline Results obtained from soil testing will enable fulfillment of the third criterion, obtaining the grounds for acceptance or rejection of the plot.

The complete cycle from testing to acceptance/ rejection takes about seven days, and this cycle can be repeated several times until a plot of land is accepted.

Soil Testing Cycle Timeline Soil Testing Conclusion In conclusion, soil testing is important because of the potential harm that can come from the consumption of produce grown in contaminated soil. Toxins are inevitable in an urban environment, and precautions should be taken to prevent harm to the community. What can be helpful in choosing a plot of land to use for the urban farm s the land history. Documents can be obtained and examined form city records.